



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/608,918

06/26/2003

David D. Martenson

D/A1690

7043

25453

7590

02/11/2005

PATENT DOCUMENTATION CENTER

XEROX CORPORATION

100 CLINTON AVE., SOUTH, XEROX SQUARE, 20TH FLOOR
ROCHESTER, NY 14644

EXAMINER

ELLIS, SUEZU Y

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 02/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/608,918

Applicant(s)

MARTENSON ET AL.

Examiner

Suezu Ellis

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on June 26, 2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claims 1 lines 11-12, claim 22 lines 11-12, and claim 31 lines 9-10, in the phrase "wherein the first encoder bar and the second encoder bars are substantially uniformly spaced", it is unclear as to whether the first set of encoder bars are substantially uniformly spaced independent of the substantially uniformly spaced second sets of encoder bars, or if all the encoder bars (the combination of both the first and second sets of encoder bars) are substantially uniformly spaced relative to one another. Please clarify. For examining purposes, the phrase will be treated as the first set of encoder bars are

Art Unit: 2878

substantially uniformly spaced independent of the substantially uniformly spaced second sets of encoder bars.

With respect to claim 19 line 2, the term "optically different" is unclear. Does the term mean different colors (red, green, blue etc.) or affecting the amplitude of the output from the sensor? Please clarify. For examining purposes, the term will be treated as the amplitude of the output from the first set of encoder bars is different from that of the second set of encoder bars.

Claims 2-21, 23-30 and 32-45 are rejected due to their dependency.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 5-19, 21-22, 27-31, and 35-45 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-23 and 49-60 of copending Application No.

Art Unit: 2878

10/608,777. Although the conflicting claims are not identical, they are not patentably distinct from each other because the printing apparatus and print mechanism parts of the claims illustrate intended use, while the make up of the optical encoder claimed is exactly the same as that in the copending application. With respect to claim 31, the phrase "where in the first encoder bar is optically configured to change an amplitude of an output of the sensor" is deemed equivalent to the first encoder bar being "optically different" from the second encoder bars, as stated in claim 49 of copending application, since the term "optically different" is being treated as a change to the amplitude of the output from the sensor.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-19, 21, 31 and 34-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al. (US 5,563,591) in view of Matsui (US 4,948,968). Hereafter, Jacobs et al. will be referred to as Jacobs.

With respect to claims 1, 8-9, 16-19, 21, 31, 35, 37 and 43-44, Jacobs discloses an optical encoder (linear or rotary) for determining the position of a moving component in a printing apparatus, such as ink jet or xerographic printers. The rotary encoder (which inherently has a grating) includes a plurality of spaced marks (equivalent to encoder bars) and as the encoder rotates, light passing through it is modulated (an inherent feature to an optical encoder) and a sensor determines the position of the rotating member. Jacobs further discloses that the light source and the sensor can be on opposite sides of the encode, thus the encoder with an optical grating and the sensor move relative to each other which is pursuant to the movement of the movable component (i.e. printhead carriage) since the encoder is mounted on the printhead carriage (col. 2, lines 27-47). Jacobs fails to disclose the optical grating having a plurality of contiguously adjacent first set of encoder bars and a plurality of second sets of encoder bars, where the two sets are substantially uniformly spaced and the first set are configured to change the amplitude of an output of the sensor. Matsui discloses an optical encoder that includes a grating (Fig. 15) with light transmissive and non-transmissive sections (equivalent to encoder bars) where the pitch of the sections gradually changes (col. 7, lines 1-5, 55-65). Note the pitch is deemed functionally equivalent to the width of the encoder bars since the larger the pitch, the larger the width of the encoder bars. Fig. 15A illustrates a plurality of contiguously adjacent first set of encoder bars (h) and a plurality of second encoder bars (f and j) that are substantially uniformly spaced and the second encoder bars are located on both sides of the first set of encoder bars.

Art Unit: 2878

Fig. 15A further illustrates that the first set of encoder bars are wider than the second set of encoder bars and are of gradually changing width, while the second set of encoder bars have a narrower, but substantially constant, width. Since the first set of encoder bars (h) are wider, more light can be transmitted (in reference to the transmissive section) or less light can be transmitted (in reference to the non-transmissive section), thus the amplitude of the output of the detector will be different than that of the second sets of encoder bars (f and j). Further, since the amplitude of the output from the sensor changes with the width of the encoder bars, these two sets of encoder bars are deemed to be optically different. It would have been obvious to a person of ordinary skill in the art to modify the encoder of Jacobs to include two sets of encoder bars configured to change the output amplitude in order to more precisely determine the position of the moveable component.

With respect to claims 4 and 34, Jacobs discloses a drum (equivalent to a print drum) used in an electrophotographic printing process (equivalent to an electrophotographic marking system) of a xerographic printer (col 8, lines 29-38).

With respect to claims 6-7 and 36, the modified Jacobs fails to disclose the first set of encoder bars being narrower than the second sets of encoder bars. However it would have been an obvious design choice to modify the encoder bars of Jacobs in order to change the amplitude of the output to more accurately detect the position of the moveable component.

With respect to claims 10-13 and 38-39, the modified Jacobs fails to disclose the first set of encoder bars being shorter or taller than the second sets

Art Unit: 2878

of encoder bars and the first set of encoder bars gradually changing in height. However, the dimensions of the encoder bars would have been an obvious design choice since a modification in dimensions of the encoder bars, whether in height or in width, would provide the functional equivalence of changing the amplitude of the output.

With respect to claims 14 and 40, the modified Jacobs fails to expressly disclose that the first set of encoder bars are of substantially identical darkness. However Fig. 15A shows two sets of encoder bars, one set with different darkness and the other set with substantially uniform or identical darkness. However, if not so, it would have been obvious to make them of substantially identical darkness in order equally absorb the light so that the photodetector can more accurately detect any changes that may occur in the amplitude of the output.

With respect to claims 15-16 and 41-42, the modified Jacobs fails to disclose the first set of encoder bars being lighter or darker than the second sets of encoder bars. However it would have been an obvious design choice to modify the encoder of Jacobs in order to change the amplitude of the output by the amount of light transmitted to the photodetector.

Claims 2-3 and 32-33, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al. (US 5,563,591) in view of Matsui (US 4,948,968), and in further view of Adams et al. (US 5,455,604). Hereafter, Jacobs et al. and Adams et al. will be referred to as Jacobs and Adams, respectively.

With respect to claims 2 and 32, the modified Jacobs discloses an ink jet marking system (equivalent to ink jet printer - Fig. 1) that as the print carriage (14) makes a pass, the recording medium (26) moves in the direction of an arrow (28) (col. 4, lines 22-24). However, the modified Jacobs fails to expressly disclose the moveable component comprising a print drum. Adams teaches the common knowledge of an ink jet printer (Fig. 4) having a rotating drum (40), which is deemed equivalent to a print drum. It would have been obvious for a person of ordinary skill in the art to modify the printhead carriage of Jacobs to include a print drum of Adams in order to feed the print media to the printer.

With respect to claims 3 and 33, the modified Jacobs discloses the movable component (14) includes an ink jet printhead (20) and a supply of ink (18) that is provided to the printhead (col. 4, lines 7-8). However, the modified Jacobs fails to expressly disclose that the supply of ink initially was solid and then is melted. Adams teaches the common knowledge of the ink jet printers including heaters to heat the ink reservoir to maintain the ink is in a liquid state (col. 6, lines 14-20). Thus it can be inferred that the ink began in the solid state since heating is a necessary step to maintain a liquid state. However, the ink supply being solid and then melted (hot-melt ink) is considered to be a design choice since the applicant has not disclosed that making the supply of ink solid and then melting it solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with aqueous ink or hot-melt ink.

Art Unit: 2878

Claims 20, 22-30, and 45, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al. (US 5,563,591) in view of Matsui (US 4,948,968) and in further view of Loewen (US 5,017,776). Hereafter, Jacobs et al. will be referred to as Jacobs.

With respect to claims 20, 22, and 45, the modified Jacobs fails to disclose the first and second sets of encoder bars having non-linear sides. Loewen discloses an optical encoder with alternating curved light (window – 200, 201) and dark (spoke – 203, 204) areas in Fig. 2 (col. 6, lines 41-45) that produce spiral images. It would have been obvious for a person of ordinary skill in the art to modify the encoder of Jacobs to include non-linear sides of both sets of encoder bars in order to produce various shapes of images depending on the design choice of the pattern. However, the applicant has not disclosed that making the sides of the encoder bars non-linear solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the curved sides of the encoder bars.

With respect to claims 25, the modified Jacobs discloses a drum (equivalent to a print drum) used in an electrophotographic printing process (equivalent to an electrophotographic marking system) of a xerographic printer (col 8, lines 29-38).

With respect to claims 26-27, the modified Jacobs fails to disclose the first set of encoder bars being narrower than the second sets of encoder bars. However, the dimensions of the encoder bars would have been an obvious design choice since a modification in dimensions of the encoder bars, whether in

Art Unit: 2878

height or in width, would provide the functional equivalence of changing the amplitude of the output.

With respect to claims 28-29, modified Jacobs illustrates in Fig. 15A that the first set of encoder bars are wider than the second set of encoder bars and are of gradually changing width

With respect to claim 30, Fig. 15A of the modified Jacobs illustrates that the second sets of encoder bars (f and j) are located on each side of the first set of encoder bars (h).

Claims 23-24, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al. (US 5,563,591) in view of Matsui (US 4,948,968), in further view of Loewen (US 5,017,776), and in further view of Adams et al. (US 5,455,604). Hereafter, Jacobs et al. and Adams et al. will be referred to as Jacobs and Adams, respectively.

With respect to claim 23, the modified Jacobs discloses an ink jet marking system (equivalent to ink jet printer - Fig. 1) that as the print carriage (14) makes a pass, the recording medium (26) moves in the direction of an arrow (28) (col. 4, lines 22-24). However, the modified Jacobs fails to expressly disclose the moveable component comprising a print drum. Adams teaches the common knowledge of an ink jet printer (Fig. 4) having a rotating drum (40), which is deemed equivalent to a print drum. It would have been obvious for a person of ordinary skill in the art to modify the printhead carriage of Jacobs to include a print drum of Adams in order to feed the print media to the printer.

With respect to claim 24, the modified Jacobs discloses the movable component (14) includes an ink jet printhead (20) and a supply of ink (18) that is provided to the printhead (col. 4, lines 7-8). However, the modified Jacobs fails to expressly disclose that the supply of ink initially was solid and then is melted. Adams teaches the common knowledge of the ink jet printers including heaters to heat the ink reservoir to maintain the ink is in a liquid state (col. 6, lines 14-20). Thus it can be inferred that the ink began in the solid state since heating is a necessary step to maintain a liquid state. However, the ink supply being solid and then melted (hot-melt ink) is considered to be a design choice since the applicant has not disclosed that making the supply of ink solid and then melting it solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with aqueous ink or hot-melt ink.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yamamoto et al. (US 6,713,756) discloses a movable scale (Fig. 28) with a plurality of contiguously adjacent first set of light reflective areas (246) that are substantially uniformly spaced independent of the substantially uniformly spaced second sets of light reflective areas (242 and 244) and the first set of encoder bars are optically different from the second set of encoder bars. He further discloses the widths of the first set of light reflective areas are wider and

Art Unit: 2878

gradually changing width compared to the substantially constant narrower width of the second set of reflective areas.

Khan (US 5,274,229) discloses in Fig. 3, an optical encoder that includes alternating transparent windows (16) and opaque spokes (17) where the length of the windows are of gradually changing height.

Higashimatsu et al. (JP 55012403 A) discloses an encoder with a scale plate (Fig. 1) with equidistant alternating bright and dark patterns, where signal bands A are disposed on both sides of signal bands B, where signal bands B has a different pattern than A (abstract).


Telephone/Fax Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suez Ellis whose telephone number is 571-272-2868. The examiner can normally be reached on 8:30am-5pm (Monday-Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2878

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800